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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

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SUBJECT: Case 4026, AI 024002, Copper 8-Quinolinolate
Review of Ecological Effects Data Submissions
(GDLNs 72-1, 72-1(a), 72-1(c), 72-3(b), 72-3(c)
72-4(a), 72-4(b) and 123-2)

Dear Dr. Rosebery:

This letter addresses your submissions of ecological effects data dated August 25 and 27, 1993 for the following reregistration requirements:

GDLN	MRID	Description
72-1(a)	429024-01	Fish Toxicity - Coho Salmon
72-1(a)	428990-03	Fish Toxicity - Bluegill Sunfish
72-1(c)	428990-02	Fish Toxicity - Rainbow Trout
72-3(b)	428990-04	Estuarine/Marine Toxicity - Mollusk
72-3(c)	429024-02	Estuarine/Marine Toxicity - Shrimp
72-4(a)	429024-03	Early Life Stage - Fish
72-4(b)	428990-05	Early Life Stage - Invertebrate
123-2	429024-04	Aquatic Plant Growth - *Nitzschia punctata*
123-2	429024-05	Aquatic Plant Growth - *Dunaliella tertiolecta*

The detailed status of each of these GDLNs is presented below.

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GDLN 72-1 - Fish Toxicity

MRID 429024-01, Oxine Copper (Copper 8-Quinolinolate): Acute Toxicity to Coho Salmon, *Oncorhynchus kisutch*, Under Flow-Through Test Conditions, is acceptable and meets the guideline requirements for an acute toxicity test using coho salmon (GDLN 72-1(a)). Based on mean measured concentrations, the 96-hour LC_{50} of 13.9 μg ai/L classifies oxine copper as very highly toxic to coho salmon. The no-observed-effect-concentration (NOEC) was 6.6 μg ai/L.

MRID 428990-03, Oxine Copper (Copper 8-Quinolinolate): Acute Toxicity to Bluegill, *Lepomis macrochirus*, Under Flow-Through Test Conditions, is acceptable and meets the guideline requirements for an acute toxicity test using bluegill sunfish (GDLN 72-1(a)). Based on mean measured concentrations, the 96-hour LC_{50} of 21.6 μg ai/L classifies oxine copper as very highly toxic to bluegill sunfish. The NOEC was 10.8 μg ai/L.

MRID 428990-02, Oxine Copper (Copper 8-Quinolinolate): Acute Toxicity to Rainbow Trout, *Oncorhynchus mykiss*, Under Flow-Through Test Conditions, is acceptable and meets the guideline requirements for an acute toxicity test using rainbow trout (GDLN 72-1(c)). Based on mean measured concentrations, the 96-hour LC_{50} of 8.9 μg ai/L classifies oxine copper as very highly toxic to rainbow trout. The NOEC was 6.2 μg ai/L.

GDLN 72-3 - Estuarine/Marine Toxicity

MRID 428990-04, Oxine Copper (Copper 8-Quinolinolate): Acute Toxicity to Embryos and Larvae of the Eastern Oyster, *Crassostrea virginica*, Under Static Test Conditions, is acceptable and meets the guideline requirements for an acute toxicity study using mollusk embryos and larvae (GDLN 72-3(b)). Based on percentage reduction in normal development of larvae and mean measured concentrations, the 48-hour EC_{50} was 36.3 μg ai/L which classifies oxine copper as very highly toxic to *Crassostrea virginica*. The NOEC was 11.1 μg ai/L mean measured concentration.

MRID 429024-02, Oxine Copper (Copper 8-Quinolinolate): Acute Toxicity to the Mysid, *Mysidopsis bahia*, Under Flow-Through Test Conditions, is unacceptable and does not meet the guideline requirements (GDLN 72-3(c)) for a flow-through estuarine shrimp toxicity study. Differences in dissolved oxygen (DO) concentrations between control and treatment solutions and uncertainty in actual concentrations negate the validity of the study. Under the conditions of the test, the 96-hour LC_{50} of 49.7 μg ai/L (based on mean measured concentrations), classifies oxine copper as very highly toxic to mysid shrimp. The NOEC was 6.8 μg ai/L. This study is considered supplemental, but is not a required study for the terrestrial non-food and residential outdoor use pattern of oxine copper. No additional data are required at this time.

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GDLN 72-4 - Early Life Stage Toxicity Test

MRID 429024-03, Oxine Copper (Copper 8-Quinolinolate): Toxicity to Embryos and Larvae of the Rainbow Trout, *Oncorhynchus mykiss*, Under Flow-Through Test Conditions, is unacceptable and does not meet the guideline requirements (GDLN 72-4(a)). The percent relative standard deviation of weight in one replicate of the solvent control was >40%. Under the conditions of the test, the maximum acceptable toxicant concentration (MATC), based upon mean measured concentrations, was >1.69 and <3.51 μg ai/L of oxine copper due to significant reductions in length and wet weight at the highest treatment level. The geometric mean MATC was 2.44 μg ai/L. This study is classified as supplemental, but is not a required study for the use pattern of oxine copper. No additional data are required at this time.

MRID 428990-05, Oxine Copper (Copper 8-Quinolinolate): Chronic Toxicity to the Water Flea, *Daphnia magna*, Under Flow-Through Test Conditions is unacceptable and does not meet the guideline requirements (GDLN 72-4(b)) for a chronic toxicity study to the water flea. DO concentrations fell to extremely low (16% of saturation) levels during the test period and the highest measured concentration in one exposure solution was greater than twice the lowest measured concentration at the same level. Under the conditions of the test, the MATC, based on the most sensitive biological parameter (length), was >6.4 μg ai/L and <10.4 μg ai/L, based on mean measured concentrations. The geometric mean MATC was 8.2 μg ai/L. This study is classified as supplemental, but is not a required study for the use pattern of oxine copper. No additional data are required at this time.

GDLN 123-2 - Aquatic Plant Growth

MRID 429024-04, Oxine Copper (Copper 8-Quinolinolate): Toxicity to the Saltwater Alga, *Nitzschia punctata*, Under Static Test Conditions, is considered supplemental since it does not meet the guideline requirements for a non-target aquatic plant study. The NOEC was not determined. Based on mean measured concentrations, the 5-day LOEC and EC_{50} for *N. punctata* exposed to oxine copper were 7.2 and 7.3 μg ai/L, respectively.

MRID 429024-05, Oxine Copper (Copper 8-Quinolinolate): Acute Toxicity to the Saltwater Green Alga, *Dunaliella tertiolecta*, Under Static Test Conditions, is acceptable and meets the guideline requirements (GDLN 123-2) for a non-target aquatic plant study. Based on mean measured concentrations, the 5-day NOEC, LOEC, and EC_{50} for *D. tertiolecta* exposed to oxine copper were 9.0, 14.3, and 15.4 μg ai/L, respectively. No additional data are required at this time.

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The DERs are attached for your records. If you have any questions, please call Kathleen Depukat at 703-308-8587.

Sincerely yours,

Jay S. Ellenberger, Chief
Accelerated Reregistration Branch
Special Review and
Reregistration Division

Enclosures
cc: Cynthia Giles-Parker, RD
Joseph Sylvester, EFED